

21st IAA SYMPOSIUM ON SPACE DEBRIS (A6)  
Late Breaking Abstracts (LBA) (LBA)

Author: Mr. Wulin Yang  
Harbin Institute of Technology, China, 604445397@qq.com

TARGET SELECTION FOR A SPACE-ENERGY DRIVEN LASER-ABLATION DEBRIS REMOVAL  
SYSTEM BASED ON ANT COLONY OPTIMIZATION**Abstract**

The laser-ablation debris removal technology can remove or detach multiple centimeter level space debris in a single mission. However, the space-energy driven platform can only rely on its own equipment capabilities to detect and identify space debris. It is necessary to select multiple potentially removable debris targets to improve the removal efficiency. In this paper, target selection for laser-ablation debris removal system is analyzed based on ant colony optimization. Intersection and interaction period was given by the optimal driving sequence calculation for multiple debris. The results showed that after being filtered by the ant colony algorithm, the number of removable debris doubled, and the de-orbit altitude increased by 15.9%. The energy utilization rate of the laser removal system has been improved by 74.6%. This optimization algorithm can significantly improve the overall work efficiency and laser energy utilization rate of the space-energy driven system.